

## **ABSTRACT**

**Title:** EMG analysis of lower limb muscles in dependence on growing muscle fatigue

**Objectives:** The main objective of this thesis is monitor and evaluate changes in EMG parameters of muscles of low extremities depending on the level of local muscle fatigue (during exercise on legpress).

**Methods:** Study included 8 subjects who completed the exercise on weight lifting machine legpress, while we were measuring 6 muscles on lower extremities by using surface EMG. The measurement was at level 75 % of maximum weight, when probands doing exercises until he had complete muscle fatigue. Data from electromyography was processed and through them we could watch the spectral distribution of the EMG signal and changes of EMG amplitude, which we relate to maximal voluntary contraction.

**Results:** After analysis of all 48 measured muscles, increased of EMG amplitude occurred in 45 of them. There was 67 % statistically significant, another 6 % was really close to significant level and remaining 23 % was insignificant.

We have 144 time series in analysis of quartile milestones (Q25, Q50 and Q75). From this number decrease of frequency occurred 135 times. There was 75 % statistically significant. Then we found out that biggest decreased was in median and mainly in Q75, it was in 82 %.

**Conclusions:** Study proved that during activity with muscle fatigue, human body recruited more motor units to finish the movement. Another proof is that during muscle fatigue, there are fatigued high-threshold motor units (FG muscle fibers). That was confirmed by decreased of frequency in spectral analysis.

**Key words:** amplitude analysis, spectral analysis, surface myoelectricography, muscle fatigue